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## Space Weather Forecast

Issued on Thursday 28 November 2024 at 00:59 Local

**This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>**

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**Space Weather Forecast Headline: Mainly Moderate Activity. Coronal Mass Ejection arrival day 1 (28 Nov) with G1-G2 Minor/Moderate Storms likely.**

### Analysis of Space Weather Activity over past 24 hours

**Solar Activity:** Moderate with one Moderate class flare observed at 27/1246 UTC from a small, but relatively new region on the southwest disc. There are eleven active regions currently on the Earth-facing Sun, with the largest of these forming a pair of region in the south-centre disc. Despite being moderately sized, these are magnetically relatively simple, and have been largely inactive. The other region of note is in the northeast. This appears to be a relatively simple region, however further details still have the potential to become apparent as this moves to a less oblique viewing angle.

An eruption was observed off the southeast disc at 27/1850 UTC from a filament, which is a line of material held together by the Sun's magnetic field, and can also be a source of coronal mass ejections (CMEs). This remains under analysis for any Earth-directed component. No other Earth-directed CMEs were observed.

**Solar Wind / Geomagnetic Activity:** Slow wind conditions persisted. Solar wind speeds measured by ACE at L1, were at background, around 350km/s. Interplanetary Magnetic Field was Weak throughout. The north-south component varied weakly between +7/-6nT. Phi angle was predominantly negative (towards the Sun). Geomagnetic activity was Quiet to Unsettled (Kp 0-3).

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

### Four-Day Space Weather Forecast Summary

**Solar Activity:** Low to Moderate activity is expected with isolated Moderate-class flares. There is a slight chance of Strong-class flares.

**Solar Wind / Geomagnetic Activity:** CME from the eruption on 25 Nov is expected to arrive on day 1 (28 Nov), but low confidence on timing and impact of this feature, with the bulk of its material passing south and east. Otherwise, mainly background winds are expected. Initially Quiet geomagnetic activity, but with a likelihood of a period of Active to G1 Minor Storms from the CME arrival on day 1 (28 Nov). There is slight chance of G2 Moderate Storms, primarily later in the day.

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CME enhancements then easing day 2 (29 Nov) with mainly Quiet to Unsettled conditions following.

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) is forecast to remain at background with only a slight chance of solar radiation storms occurring.

### Geomagnetic Storms

| Geomagnetic Storm           | Level    | Past 24 Hours<br>(Yes/No) | Day 1<br>(00-24 UTC) | Day 2<br>(00-24 UTC) | Day 3<br>(00-24 UTC) | Day 4<br>(00-24 UTC) |
|-----------------------------|----------|---------------------------|----------------------|----------------------|----------------------|----------------------|
| Probability<br>(Exceedance) |          |                           | (%)                  | (%)                  | (%)                  | (%)                  |
| Minor or Moderate           | G1 to G2 | No                        | 60                   | 30                   | 5                    | 5                    |
| Strong                      | G3       | No                        | 10                   | 5                    | 1                    | 1                    |
| Severe                      | G4       | No                        | 1                    | 1                    | 1                    | 1                    |
| Extreme                     | G5       | No                        | 1                    | 1                    | 1                    | 1                    |

### Radio Blackouts - X-Ray Flares

| X-Ray Flares | Level              | Past 24 Hours<br>(Yes/No) | Day 1<br>(00-24 UTC) | Day 2<br>(00-24 UTC) | Day 3<br>(00-24 UTC) | Day 4<br>(00-24 UTC) |
|--------------|--------------------|---------------------------|----------------------|----------------------|----------------------|----------------------|
| Probability  |                    |                           | (%)                  | (%)                  | (%)                  | (%)                  |
| Active       | R1-R2<br>(M Class) | Yes                       | 70                   | 70                   | 70                   | 70                   |
| Very Active  | R3-R5<br>(X Class) | No                        | 10                   | 10                   | 10                   | 10                   |

### Solar Radiation Storms (High Energy Protons)

| Radiation Storms                                                                                           | Level<br>(cm <sup>-2</sup> sr <sup>-1</sup> s <sup>-1</sup> ) | Past 24 Hours<br>(Yes/No) | Day 1<br>(00-24 UTC) | Day 2<br>(00-24 UTC) | Day 3<br>(00-24 UTC) | Day 4<br>(00-24 UTC) |
|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------|----------------------|----------------------|----------------------|----------------------|
| Probability<br>(Exceedance)                                                                                |                                                               |                           | (%)                  | (%)                  | (%)                  | (%)                  |
| Active                                                                                                     | ≥ S1                                                          | No                        | 10                   | 10                   | 10                   | 10                   |
| Very Active                                                                                                | ≥ S3 *                                                        | No                        | 1                    | 1                    | 1                    | 1                    |
| * S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = cm <sup>-2</sup> sr <sup>-1</sup> s <sup>-1</sup> ) |                                                               |                           |                      |                      |                      |                      |